

ABSTRACT OF THE DISCLOSURE

5 An arrangement (10) for efficiently generating tunable pulsed laser output at 8-
12 microns. The arrangement (10) includes a laser (12), a first optical parametric
oscillator (14) of unique design, and a second optical parametric oscillator (22). The
first oscillator (14) is constructed with an energy shifting crystal (20) and first and
second reflective elements (16) and (18) disposed on either side thereof. Energy from
10 the laser (12) at a first wavelength is shifted by the crystal and output at a second
wavelength. The second wavelength results from a secondary process induced by a
primary emission of energy at a third wavelength, the third wavelength resulting from
a primary process generated from the first wavelength in the crystal. Mirror coatings
are applied on the reflective elements (16 and/or 18) for containing the primary
15 emission and enhancing the secondary process. The second optical parametric
oscillator (22) then shifts the energy output by the first OPO (14) at the second
wavelength to the desired fourth wavelength. In the illustrative embodiment, the first
optical parametric oscillator (14) includes an x-cut rubidium titanyl arsenate crystal
20 (20) and the second optical parametric oscillator (22) includes a silver gallium
selenide crystal. The first wavelength is approximately 1.06 microns, the second
wavelength is approximately 3.01 microns, the third wavelength is approximately 1.61
microns, and the fourth wavelength is in the range of 8-12 microns.